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Rand Crafts
Intermountain Power Service Corporation
850 West Brush Wellman Road
Delta, Utah 84624

Subject: IPP Over-Fire Air Project: Carbon Monoxide Impacts on Provo/Orem Non-Attainment Area

Dear Rand:

This letter presents a summary of our analysis of potential carbon monoxide (CO) impacts from the proposed addition of over-fire air to the existing Units 1 and 2 (OFA Project) at the Intermountain Power Project (IPP). CH2M HILL evaluated the impact from the CO emissions resulting from the OFA Project on the following:

- Provo/Orem Non-Attainment Area for Carbon Monoxide

Selected Model

To evaluate air quality impacts in the Provo/Orem area, CH2M HILL used the EPA CALPUFF model, which is the recommended model for long-range (greater than 50-km) transport. CALPUFF was run with regulatory default technical options, with the exception of wet and dry deposition, which was not modeled. Deposition was not modeled because of uncertainties in the settling velocities for CO gas. This approach would lead to more conservative results since no depositional removal from the plume was modeled. Meteorological input to CALPUFF consisted of the 1996 windfield that was developed for the IPP3 Project.

Receptor Grid

The receptor grid for the CALPUFF modeling consisted of receptors that were placed at the non-attainment area boundary and interior areas at 1-kilometer spacing. Terrain in the non-attainment area was accounted for by assigning elevations to each modeling receptor. CH2M HILL used Digital Elevation Model (DEM) data from the U.S. Geological Survey (USGS) to determine receptor elevations. We obtained DEM data from the USGS National Elevation Dataset (NED). The NED has been developed by merging the highest-resolution, best-quality elevation data available across the United States, and is the result of the USGS

effort to provide 1:24,000-scale (7.5-minute) DEM data for the entire continental United States. Figure 1 shows the relative locations of the IPP facility and the Provo/Orem non-attainment area.

Building Downwash

Building downwash effects for structures near Units 1 and 2 were determined with the EPA Building Profile Input Program (BPIP, version 95086).

Emissions and Exhaust Parameters

Maximum 1-hour CO emissions for the modeling analysis were based on an emission rate of 0.62 lb/MMBtu. This emission rate is based on data collected during the 2003 OFA performance testing for IPP Unit 1. To arrive at a conservative estimate of worst-case 1-hour emissions at approved full uprate load operation, the value of 0.62 lb/MMBtu was multiplied by the maximum heat input for full load (9,225 MMBtu/hr). This worst-case 1-hour emission rate was input to the model to estimate both 1-hour and 8-hour CO impacts, which serves to produce a conservative estimate of 8-hour impacts. Another conservative measure was the use of the exit velocity for reduced (50% load). By combining the worst-case emissions for full load conditions with the exit velocity for partial load, the results of the analysis are quite conservative.

Because the Unit 1 and Unit 2 flues are released from a common shell (stack) location, both units were modeled with a common pair of Universal Transverse Mercator (UTM) coordinates, representing the center of the common stack. Similarly, because the maximum estimated emissions are identical for each unit, the two sources were modeled as a single point source, with the emissions for a single unit doubled to represent both units within the model.

Results

CH2M HILL compared the highest 1-hour and 8-hour impacts predicted by the CALUFF model to the Class II Area modeling significance levels. The highest predicted 1-hour impact was 43.7 $\mu g/m^3$. According to modeling guidelines published by the UDAQ: "In general, the receptor network will be considered adequate if the difference in concentrations at neighboring receptors is no larger than one half the difference between the maximum modeled concentration and the NAAQS or increment under consideration" (UDAQ, 2000). In this case, the air quality standard under consideration is the Class II modeling significance level, and one half of the difference between the maximum modeled concentration and the modeling significance level (2,000 $\mu g/m^3$) is much less than the threshold for receptor grid adequacy.

The maximum 8-hour impact was 23.1 $\mu g/m^3$. As with the 1-hour impacts, the difference between concentrations at neighboring receptors is much less than one half of the difference between the maximum modeled concentration and the modeling significance level (500

$\mu g/m^3$). Therefore the receptor network was adequate to capture the maximum 8-hour impacts of CO.

The maximum predicted 1-hour concentration of CO is less than 3% of the modeling significance level, while the maximum 8-hour concentration is less than 5% of the modeling significance level. These modeled impacts were conservatively predicted for full operation of both units after completion of the OFA Project as opposed to simply evaluating the increase in CO emissions that would be expected from the project. Therefore the analysis demonstrates that air quality impacts of CO from Units 1 and 2 after completion of the OFA Project will be insignificant in the Provo/Orem non-attainment area.

References

UDAQ, 2000. *Utah Division of Air Quality Modeling Guidelines (Revised Draft)*, Utah Division of Air Quality, Technical Analysis Section, August 17, 2000.

Please contact me at (720) 286-5362 if you have any questions.

Sincerely,

CH2M HILL

James (Josh) Nall
Air Quality Meteorologist

cc: Steve Sands/CH2M HILL/SLC

Figure 1 – Location of Provo/Orem Non-Attainment Area for Carbon Monoxide